



Context

Given Singapore's limited size and strong competition between different types of land use, agricultural land is now less than 1% of overall land use. In recent years, the city state has also been looking to alternative spaces that can optimise under-utilised spaces within the city, such as rooftops, for food production. As more entrepreneurs recognise the opportunity and consumers behaviour changing, urban farming has been gaining traction. Given its unique context, challenges and opportunities, Singapore has announced an ambitious target ("30 by 30") of reducing its reliance on imports and to produce 30% of its nutritional needs domestically by 2030 - a significant increase from the current less than 10% share.

Food from urban farms present sustainable opportunities as they require less time and carbon miles to transport to the market, and can meet the rising demand of health- and environmentally- conscious consumers for fresher food with a lower carbon footprint. Their visibility in the city also piques interest among young professionals in food production. Urban farming is thus a budding sector in Singapore, and spurred by its "30 by 30" goal, push and support systems for startups and SMEs.

However, the incursion of pest and disease is a challenge for agriculture, especially for urban farms. There are limited options for control as a majority of conventional crop protection methods such as pesticide spraying might not be applicable due to close proximity to the community. Given the emerging threats from new crop pests and diseases (e.g. fall armyworm) and the growing demand for production of fresher produce with lower carbon footprint within cities, there is a need for suitable solutions that are safe, effective and environmentally friendly to minimise crop loss caused by pest and disease in urban farms.

Dataset

<https://www.kaggle.com/vbookshelf/v2-plant-seedlings-dataset>

Outcome

Build an IoT + ML solution to

- Identify crop and weed seedlings
- Identify the nutrition need of a plant and provide it in real time